

# Rock! Pattern! Systems! UBD (Understanding By Design) Framework: Fourth Grade

Desired Results
Goals of the Program
<p><b>Students will...</b></p> <ul style="list-style-type: none"><li>• Enrich their understanding of a place through inquiry.</li><li>• Experience National Parks as places for learning and recreation and develop a personal connection with their local National Parks.</li><li>• Gain first-hand experience at Point Bonita with the geologic features of underwater volcanoes.</li><li>• Appreciate how an individual scientist can impact our way of thinking about the Earth.</li></ul>
Transfer
<ul style="list-style-type: none"><li>• Analyze and interpret maps.</li><li>• Identify evidence in support of an explanation.</li><li>• Recognize the challenges in getting new scientific evidence widely accepted.</li></ul>
Meaning
<p style="text-align: center;"><b><u>Essential Question:</u></b></p> <p style="text-align: center;"><i>How can maps change the way we think about land and sea?</i></p> <p><b><u>Enduring Understandings:</u> Students will understand that...</b></p> <ul style="list-style-type: none"><li>• The Earth is a dynamic, changing place.</li><li>• Landscapes change due to a variety of natural and human factors, both local and global.</li><li>• Some rock formation patterns help geologists predict where earthquakes and volcanoes occur.</li><li>• New scientific data changes the way we think about land and sea.</li></ul>
Acquisition
<p><b>Students will know...</b></p>

- The Earth's crust is made of large plates that move.
- The ocean floor is not flat.
- Agents of weathering form and change landscapes.
- Locations of earthquakes and volcanoes are in patterns.

**Students will be able to...**

- Analyze and interpret data from maps.
- Recognize patterns of rock formations on Earth's surface.  
Pose questions and construct evidence-based explanations.

## Evidence

**Students will show their learning by...**

1. Explaining, in the form of an illustrated story, poem, or scientific narrative, how underwater volcanoes form or how they appear on land.

**...and by doing one of the following:**

2. Explain, in an informative text, how the Tharp-Heezen ocean floor map changed our understanding of the Earth.
3. Use evidence to answer their own question about patterns of ocean floor structures or underwater volcanoes.

## CA Next Generation Science Standards

**4-ESS1-1:** Identify evidence from patterns in rock formations and fossils in rock layers to support an explanation for changes in a landscape over time.

**4-ESS1.C: The History of Planet Earth:** Local, regional, and global patterns of rock formations reveal changes over time due to Earth's forces, such as earthquakes. The presence and location of certain fossil types indicate the order in which rock layers were formed.

**4-ESS2-2:** Analyze and interpret data from maps to describe patterns of Earth's features.

**4-ESS2.B: Plate Tectonics and Large-Scale System Interactions:** The locations of mountain ranges, deep ocean trenches, ocean floor structures, earthquakes, and volcanoes occur in patterns. Most earthquakes and volcanoes occur in bands that are often along the boundaries between continents and oceans. Major mountain chains form inside continents or near their edges. Maps can help locate the different land and water features on Earth.

**Crosscutting Concept:** Patterns can be used as evidence to support an explanation.

## CA Common Core Standards

### **Speaking and Listening:**

**1.4:** Engage effectively in a range of collaboration discussions (one-on-one, in groups, and teacher-led) with diverse partners on grade 4 topics and texts, building on others' ideas and expressing their own clearly.

### **Writing:**

**4.2:** Write informative/explanatory texts to examine a topic and convey ideas and information clearly.

**4.9:** Draw evidence from literary or informational texts to support analysis, reflection, and research.